DOCUMENT RESUME

ED 188 257 CS 502 946

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TITLE Communication Patterns in Normal and Disturbed Families.
PUB DATE May 80
NOTE 30p.; Paper presented at the Annual Meeting of the International Communication Association (Acapulco, Mexico, May 18-23, 1980).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Adults; Family (Sociological Unit); *Family Relationship; *Interaction; *Interaction Process Analysis; *Interpersonal Relationship; Research; *Schizophrenia; *Speech Communication; Speech Habits
IDENTIFIERS *Communication Research

ABSTRACT

A study of formal communication in 30 families each with a schizophrenic son and 28 families, each with a "normal" son was conducted in Germany. By means of factor analysis four types of formal speech behavior were identified using musical terminology: "staccato," a highly fragmented flow of conversation with high turnover rate; "solo" in which verbal inactivity dominated; "tutti," very lively conversation with frequent interruption; and "legato," long periods of simultaneous speech and a low turnover rate. "Staccato" was the only type of speech behavior showing a relationship with social class. It was much more strongly represented in the conversation of lower class than middle class families. The speech patterns that were examined showed no relation to the age of the family members. The families with the schizophrenic sons showed an excess of "solo" and a lack of "tutti." These were the only two factors that significantly discriminated between the two groups of families. Families with a schizophrenic patient who had to be readmitted within two years after the first discharge from psychiatric inpatient treatment showed a trend to a lower degree of "tutti." (HKE)

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COMMUNICATION PATTERNS IN NORMAL AND DISTURBED FAMILIES.+

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+ Paper presented at the XXX International Conference on Communication, Acapulco, May 1980

CS506296

Communication patterns in normal and disturbed families.

Our perception of any human interaction is of necessity limited and subjective. We can only appreciate a selection of the complex of events which take place in it.
With the help of systematized methods of observation it is possible to regulate the selection of data and so detect perceptual distortions which would otherwise remain undetected. This selectivity laid down by explicit rules with a given purpose is to be contrasted with the subjective selection which is implicit in the process of normal non-critical observation. Various observational methods call for differing degrees of subjectivity. Rating scales allow the observer most scope for subjective judgment. With category systems a greater degree of prestructuring of the field of observation is necessary. With sign systems the number of events which can be registered at all is greatly reduced. Rating scales involve a great deal of condensation of data and are therefore most prone to faults in the method which it is not possible to eradicate. Category systems are also subject to distortion due to the interpretation which the require. Sign systems on the other hand require no more than attentiveness on the part of the observer (MANZ, 1974).

Because of these differences between the various observational methods , taking reliability and validity particularly into account, we decided to study family interaction from various angles and so obtain the data for a multilevel analysis.

In this paper we present the results of our attempt to analyse the formal aspects of communication in families using a sign method, or to put it more accurately our attempt to analyse family conversation by the linear recording of periods of speech and of silence. What interested us was how often and for how long each member spoke or was silent, how often and for how long he interrupted others,and how often and for how long several members spoke or were silent simultaneously and so on. The work of various investigators (BRÄHLER,197 ; BRÄHLER et al., 1974; CHAPPLE, 1940; CHAPPLE et al., 1960; MATARAZZO et al., 1961, 1965; ZENZ und BRÄHLER, 1974) gave us reason to hope that these observations simple as they might appear at first to be, would give us insight into the people interacting and their relationships to one another. As in present day psychiatric research into the family, we examined first and foremost the communication pattern in the family as a system and only occasionally the communication between members as individuals.

Our first goal was to produce a classification of communication behavior in families and for this we used quantitative methods of analysis . Secondly we tried to answer the following questions:

1. What influence do age and social class have on the formal communication behavior in families?

2. Does our classification of formal communication patterns allow differentiation between the so-called normal and the

disturbed, in this case in families where one member was schizophrenic?

3. Are communication patterns in families with schizophrenic members of good premorbid social adjustment different from those in families with schizophrenic members whose social adjustment was poor even before they became ill?

4. Does the communication pattern observed at the end of the first period of psychiatric inpatient treatment allow us to make predictions about the patient's subsequent psychiatric career?

Subjects.

"Schizopresent" families.

We studied 30 families with male patients, who had to be hospitalized for the first time with a diagnosis of schizophrenia. This was an approximately complete survey of all patients from thegreater Hanover region in the period from January 1975 to June 1977, who fulfilled several preset psychiatric and demographic selection criteria. Patients with the diagnosis borderline cases or schizoaffective psychoses, alcohol- or narcotic induced psychoses were excluded from the study. The diagnosis was based on a standardized clinical interview (PRESENT STATE EXAMINATION, WING et al., 1974). Only those patients were taken into account in which the risk of false positive diagnoses did not exceed 4 % (CARPENTER et al., 1973). The response rate was 88.2 %.

Normal families.

This group consists of 28 families with adolescents/young adults who had been admitted consecutively to two surgical hospitals in Hanover because of an acute abdominal condition or requiring plastic or accident surgery. Neither the patient nor the parents were stated to have already required psychiatric help. The response rate here reached 63.5 %.

The same biographical/demographic selection criteria were applied to both groups: the sons were to be between 15 and 30 years old and single. Both natural parents were to be still living together in the married state. The sons should have grown up with their parents and have been in close contact with them up to the time of our study. The language of communication in the family had to be German.

The demographic data of the parents of the two groups are compiled in Table 1. Statistical analysis by means of the t - test (age) and the χ^2 - test (school education, social class) did not reveal any significant differences.

Methods.

As soon as the patient, that is the son was due to be discharged from either psychiatric or surgical treatment, the family (father, mother, and son) was invited to come to a session in the University Medical School in Hanover, this session being structered according to STRODTBECK's revealed differences technique (1951). First of all we asked each family member to fill out a questionnaire containing 40 problem situations

from everyday family life. In each case two possible solutions were given for him to choose or her to choose between. Problems concerning the relationship between the parents, between parents and child, and between family and environment were represented in equal numbers. Some of the questions were taken from MISHLER and WAXLER's catalogue (1968). Problem situations for which the family members suggested differing solutions were afterwards presented to the whole family and the family was instructed to try to reach agreement by discussion. The family was then left alone for 30 minutes to do this, video and stereotape recordings of the conversation being made.

In order to record the communication behavior we used the principal of the Interaction Chronograph described by CHAPPLE (1940). For this we used an EEG machine the speed of which was adjusted to 10 mm/sec. In place of the electronic recording system of the instrument we fitted 3 mechanical recorders attached to keys one key for each member of the family. The observers listened simultaneously with head phones to the stereophonic tape recordings of the family conversation each observer concentrating on one particular member of the family. The voices of the other two members were acousticly faded out for him as far as this was technically possible. Each observer had then to record the speech of the family member allotted to him by depressing a corresponding key for as long as this person was speaking. We were thus able to produce a visual recording of the course of conversation (Figure 1). At the given speed of paper flow of 10 mm/sec the smallest division on the paper strip

corresponded to 6/10 sec and this we defined as the basic time interval. This time scale also allowed the recording of non-lexical utterances (that is interjections such as "eh", "hm"). Although this method is without doubt less precise than a fully automatic recording (compare BRÄHLER and ZENZ, 1974) nevertheless control of the inter- as well as intra-observer reliability showed values which are certainly sufficient for the purpose of our study (94, 98 % resp.).

Definitions of the formal characteristics of communicative behavior.

The information recorded for each time interval (from now on referred to as "basic interval") served as the basic data for the evaluation of the family's normal communicative behavior. For each basic interval for instance we recorded whether anybody was talking or not and if so which of the three members of the family it was. We then examined the time sequence of these phenomena and noted the state of conversation and any alteration of state occuring in each basic interval according to the formal characteristic shown in it. We were then in a position to analyse the conversation as a whole giving scores relating to persons when appropriate.

The characteristic states and alterations in state we defined as follows:

1. Speech. A family member is recorded as speaking in a given basic interval when he was speaking either during this interval

or in the intervals preceding it (t - 1) and the following one (t + 1). Pauses in the flow of speech of the length of one basic interval or shorter are disregarded. In this definition of speech the speech activity of the respective other two persons is not taken into account.

2. Simultaneous speech. It is the state in which two or more family members are talking at the same time and is defined in the same way as the state of speech with regard to individuals.

3. Silence. A family is regarded as silent in a basic interval when no one is speaking in this and the preceding or in this and the following basic interval.

4. Pause. This refers to a break in the utterance of a single individual. He is regarded as making a pause in a basic interval when no one else speaks in this interval and when no one else has spoken between the time when he stopped speaking and started speaking again.

5. Interruption. An interruption or attempted interruption is regarded as taking place when a person B starts talking in a basic interval in which person A is still talking. The interruption is judged unsuccessful when B stops talking before A, successful when A before B, and undecided when A and B stop talking at the same time. All six possible combinations of persons are taken into account. The speech behavior of the third person is disregarded.

6. Direct take over. Direct take over is when B starts talking in the first or second basic interval after the

basic interval in which A stopped talking. Again all six dyadic combinations were examined disregarding the speech behavior of the third family member.

7. Change of speaker. When A stops talking and B starts they are regarded as speaking in the sequence A - B but only when B is the only person starting to speak. In situations when two or more people speak together a particular sequence is disregarded.

Analysis of the whole conversation.

We examined the accounts of the various characteristic states (speech, simultaneous speech, silence, pause) in a given conversation as follows. We devided the conversation up into periods, each period corresponding to the duration of a state. We then determined the following values for the various states:

- absolute frequency
- mean duration
- maximum duration
- standard deviation of duration

The calculation was done separately for each combination of speakers in the case of simultaneous speech, for each of the individuals in the case of speeches and pauses, and for the whole family in the case of silences.

We also determined for the whole conversation the absolute frequencies of all forms of alteration in state (interruptions, direct take over, change of speaker). Again we devided these up according to the persons involved.

Analysis of the conversation of each family.

Values for the characteristic states not linked to individuals or combinations of individuals did not need modification. For the other characteristic states we made the following calculations:

- the absolute frequencies of periods of all individuals or combinations of individuals were summed up;
- the average of the mean durations and standard deviations of periods for all individuals or dyadic pairs were calculated;
- the average maximum duration of period for all individuals together and for all combinations of individuals was derived from the maximum values.

All together the conversation of each family is characterised by 21 variables:

speech	number average mean duration average standard deviation maximum duration
simultaneous speech	number average mean duration average standard deviation maximum duration
silence	number of periods of silence average mean duration average standard deviation maximum duration
pause	number average mean duration average standard deviation maximum duration
interruption	number of successful interruptions number of unsuccessful interruptions number of undecided interruptions
direct take over	number
change of speaker	number

The items listed above as "averages" refer to individuals or combinations of individuals, "mean duration" and "standard

deviation" to the frequency distribution during the course of conversation for individuals or combinations.

Results.

Typology of formal communication patterns in families.

The 21 variables listed above were subjected to an explorative factor analysis (principal component method). The values of all 58 families entered into the analysis. A four factor solution was chosen (all factor with an eigenvalue higher than 1.00 were regarded). By the 4 factors 82.3 % of the total variance were accounted for. The VARIMAX rotated factor matrix is shown in Table 2. 16 of the 21 factorized variables loaded highly only on one factor (factor loading >0.50). 4 variables loaded on 2 factors (number of speeches, periods of silence, pauses and direct take over). The average mean duration of pauses did not show significant factor loadings.

The factors characterizing the different communication patterns which we have managed to find are as follows (Figure 1):

Factor 1 ("staccato") accounts for 30.6 % of the extracted variance. It is characterized by high frequency of speeches; both average and maximum duration is very short and subject only to slight deviation. The flow of conversation is interrupted by silence and pauses whereby only the latter last relatively long. The utterances of the family members are clearly separated. On the whole the conversation strikes one as being fragmented, the turn over rate is very high due to the frequent change in speaker.

Factor 2 ("solo") accounts for 26.9 % of the extracted variance. It is characterized by frequent and long lasting periods of silence, the duration of which is subject to large deviation. Pauses are also common and can be very long but their duration is very variable. This factor is thus characterized by phases of inactivity. There is a relatively low rate of interruptions successful or unsuccessful.

Factor 3 ("tutti") accounts for 23.4 % of the extracted variance and is characterized mainly by high frequency of speech periods and periods of simultaneous speech. There is a correspondingly high frequency of interruptions of all types. Direct take overs are common that is the utterances of two speakers often follow closely on one another without overlapping. Passages of conversation of this type create the impression of liveliness and energy provided that they are well orchestrated and not too much disturbed by "noise".

Factor 4 ("legato") accounts for 19.1 % of the extracted variance. It is characterized mainly by long periods of simultaneous speech which is also very variable. The individual statements are on average relatively long, periods of silence and pauses are uncommon,the turn over rate is relatively low. A family in whose communication this factor is strongly present gives the impression of being a close system dominated by a kind of "horror vacui".

Relationship between age and social class on one side and formal communication behavior on the other.

In examining the effects of age we distinguished between families in which the sum of the ages of the three members was less than 120 years and those in which the sum of the ages was higher. The criterion for social classification was the fathers' occupation, using KLEINING and MOORE's SSE (1968). Four 2- and 3-way analyses of variance covering age, social class and diagnosis, the index person as the independent variable and the four factors of speech behavior as the dependent variables, gave a clear relationship between social class and factor 1 ("staccato") and no other clear relationship. This factor was dominant in the communication behavior of families of the lower class ($p < .001$). Apart from this the variables age and social class had little effect on formal speech behavior, there were no interactions between these two variables and none either between these and diagnosis.

Comparison between "normal" and "schizopresent" families (Table 3).

Factor 1 ("staccato") is equally represented in the family conversation of both groups. This means that contrary to what might have been expected on the basis of recent literature (e.g. SINGER and WYNNE, 1965) the conversation in "schizo-present" families is no more fragmented than in the normal control families.

Factor 4 ("legato") also shows a similar distribution in the two groups. It would have been reasonable to expect that

the conversation in the"schizopresent" families will tend to be dominated by one of the parents. This is not so but there is an increase in monologues and a marked isolation of the speakers which is an indication of the rigidity of the role structure established in these families.

As regards factor 2 ("solo") the families with a schizophrenic member tend to show more inactivity. When the conversation is analysed according to speaker we see that the psychiatrically ill son is underrepresented.The dominance of this factor also indicates low rate of exchange of communication and the inter-actional stasis makes the individual family member more isolated. In short the connex of communication is loosened.

In the "schizopresent" families there is a definite lack of speech passages of type 3 ("tutti"). This particularly complex interaction pattern is replaced by a simpler pattern as if a process of de - differentiation has taken place. Interruptions which indicate a competetive element and attempts to dominate others (MISHLER and WAXLER, 1968) are poorly represented. The conversation as a result lacks colour and is rather boring.

These results are confirmed by the combined investigation of all four factors by dicriminant analysis. Proceeding step-wise the maximization of the MAHALANOBIS - distance serving as the selective criterion, factor 3 ("tutti") first entered into the analysis followed by factor 2 ("solo"). The other two factors were left out because their F - value was smaller than 1both before and afterwards and this was regarded as the criterion excluding them from the next step. The group

differences after each step are significant ($p < .05$). In the re-classification 77 % of the "schizopresent" families and 75 % of the "normal" families were found to be correctly placed. The frequency distribution of the values of discriminant functions are shown in Figure 2 for both groups separately.

Relationship between premorbid social adjustment of the schizophrenic son and formal speech behavior in the family.

In various studies (c.f. MISHLER and WAXLER, 1968) a relationship was established between the level of premorbid social adjustment of schizophrenic patients and family interaction structures. Using a shortened form of the PHILLIPS - scale developed by HARRIS (1975) we assessed the degree of social adjustment of the schizophrenic patients before the onset of the psychosis. 12 patients could be classified as well adjusted and 18 as poorly.

Results of the crosssectional comparison of "schizopresent" families taken together and the "normal" families prompted us to put forward the hypothesis that the families with poorly adjusted sons should show a higher degree of factor 2 ("solo") and a lower degree of factor 3 ("tutti") than those with well adjusted sons (t - test, one - tailed). The two other factors should show an even distribution in this two subgroups (t - test, two - tailed). Table 4 demonstrates that we were able to verify our hypothesis for factor 2 as well as for factor 1 and 4. The reduction in factor 3 which we had expected was however not observed.

When a further comparison is made between the families with "normal" sons and those with poorly adjusted schizophrenics there than appear highly significant differences in the relevant factors and those differences are in the direction which was to be expected ("solo" $t = 2.40$; $df = 44$; $p < .01$. "tutti" $t = 3.81$; $df = 44$; $p < .001$).

Relationship between formal speech behavior in the family and the later psychiatric career of the schizophrenic son.

We were interested to find out whether it was possible at the time of the first discharge from psychiatric treatment to give a prognosis concerning the later psychiatric career of the schizophrenic son on the basis of the family communication pattern. The first results of a 2 - year follow up are now available. 13 patients needed readmission during this time, 17 patients remained out of hospital.

We then put forward a hypothesis on similar lines to our last, that in the families where the son had to be readmitted compared with families in which this was not so factor 2 ("solo") should be increased and factor 3 ("tutti") reduced. (t -test, one - tailed). The two other factors 1 ("staccato") and 4 ("legato") should on the other hand show no significant differences. With factor 3 we were in fact able to establish a trend in the expected direction but with the other three factors we could discover no significant differences between the two subgroups (Table 5).

Comparison between families with sons who had to be readmitted and the "normal" families showed once more a highly significant difference for factor 3 ($t = 3.64$; $df = 39$; $p < .001$) but no significance with regard to factor 2 ($t = 1.67$; $df = 39$; $p > .10$)

Discussion.

Factor analysis of the family communication dealing with the characteristic states of conversation produced four factors indicating the formal pattern of conversation which we labeled "staccato", "solo", "tutti" , "legato" taking these terms from musical terminology.

"Staccato", the first type, showed a clear relationship with social class: It is much more clearly marked in lower class families than in middle class families. It is not clear whether this indicates a conversation pattern which is genuinely related to social class or whether this connection is in fact determined by the situation in which the families were examined. It could be that this fragmented conversational style represents the restricted linguistic competence of lower class people, a fact which is supported by socio - linguistic studies. But it could also indicate a high level of anxiety. The structered setting in which the sessions took place could well cause more misunderstandings and insecurity in a lower class than in a middle class family, the members of which could possibly adjust better to this unusual situation.

The other three factors did not show a significant relationship with the socio - demographic variables investigated here.

There was however a relation between an excess of factor 2 ("solo") with a corresponding lack of factor 3 ("tutti") and the presence of a psychiatrically ill that is schizophrenic son in the family. We also found a relation between excess of factor 2 and the patient's social adjustment before the onset of the psychosis and in addition to this some relation between a lack of factor 3 and the patient's further psychiatric career. The design of our study was such that we cannot draw any conclusions as to the etiological significance of communication patterns which came to light. It does appear however from the result of the follow - up that they can be of some significance with regard to the patient's further development and his relationship to his family.

The de - differentiation of processes of communication has also been revealed by other multilevel analyses of family interaction which we mentioned at the beginning of this paper. Ratings made by two psychiatrists on 5 - point scales showed a much fuller interaction in "normal" than in "schizo-present" families. In the first "harmonic contrapunctual and rhythmic aspects was structured and coordinated much better". Conversations in "schizopresent" families recorded on video-tapes were much more tiring for the observer to listen to. Corresponding results were produced by analysis of the non - lexical speech content by means of MAHL's method. Fewer "speech disturbances" (repetitions and omissions) were observed in the "schizopresent" than in the"normal"families.

On the basis of our findings we can make the following statement which at first appears paradoxical. Judging by "speech disturbances" - simultaneous speech, interruptions, repetitions and omissions - normal and well functioning families communicate in a more "disturbed" way than disturbed families, or rather than families with a schizophrenic son. (In families with a dissocial member the situation may be completely different).

The lower degree of complexity of formal communication patterns which we discovered in the "schizopresent" families also has a cognitive aspect. In the first place less perceptual flexibility is required because of less frequent interruptions that is, the participants in the conversation do not have to switch their attention frequently. Secondly as a result of the understimulation connected with frequent and prolonged pauses and periods of silence the individual has to exert himself a good deal to maintain his attention. It was not the purpose of this paper to analyse how these phenomena are related to the schizophrenic disturbance.

Various authors have tried to draw conclusions from the formal speech patterns as to the structure of family relations. It is extremly difficult to operationalize the relationship characteristics such as dominance (TURK and BELL, 1972; HADLEY and JACOB, 1973) and the question of validity in this area still remains completly open. We may however be justified in seeing the first signs of a dissolution of the structure of family relationships as well as an increasing isolation of the individual family members in the loosening of the communicational

framework which we clearly observed in the "schizopresent" families. It is relevant to mention here that our investigations into interpersonal perceptions in these families revealed a similar tendency. There was a striking lack of coherence, the family bonding examined from this angle showing a high degree of disruption.

Abstract

This paper presents results of a study of formal communication in 30 "schizopresent" and 28 "normal" families. By means of factor analysis four types of formal speech behavior could be identified: "staccato" (= highly fragmented flow of conversation with high turn over rate), "solo" (in which verbal inactivity dominates), "tutti" (= very lively conversation with frequent interruptions), and "legato" (with long periods of simultaneous speech and a low turn over rate).

"Staccato" was the only type showing a relationship with social class. It is much more strongly represented in the conversation of lower class than of middle class families. The speech patterns which we examined showed no relation to the age of the family members.

"Schizopresent" families showed an excess of "solo" and a lack of "tutti". These were the only two factors which significantly discriminated between families with schizophrenics and "normal" families. Families with a schizophrenic son of poor pre - morbid social adjustment tended to show a higher proportion of "solo". Families with a schizophrenic patient who had to be readmitted within two years after the first discharge from psychiatric inpatient treatment showed a trend to a lower degree of "tutti".

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Tab. 1: Sociodemographic data of the index and control groups

	Father		Mother		Son	
	Index	Control	Index	Control	Index	Control
Age (years)	55.1 9.4	52.1 9.3	51.8 9.2	48.1 7.6	21.6 3.9	19.8 3.2
Education (N)						
Primary school	15	12	17	16	14	11
Secondary school	6	6	12	9	7	10
Senior/professional matriculation	9	10	1	3	9	7
Profession: social class (N)[1]						
Lower class	5	3	2	-	-	-
Upper lower class	8	6	3	5	4	1
Lower middle class	6	6	5	8	1	3
Middle class	6	7	-	-	-	1
Upper middle class	5	6	1	1	-	-
Without occupation	-	-	19	14	25	23

[1] Self-assessment of social class (SSE)
(Kleining and Moore, 1968)

Table 2 VARIMAX Rotated Factor Matrix.

	Factor 1	Factor 2	Factor 3	Factor 4
Speeches				
Number	0.574	-0.007	0.782	-0.147
Mean Duration	-0.826	-0.154	-0.312	0.410
Mean Standard Deviation	-0.935	-0.078	-0.131	0.175
Maximum Duration	-0.885	0.024	-0.031	-0.050
Simultaneous Speeches				
Number	-0.070	-0.305	0.906	0.227
Mean Duration	-0.236	-0.224	0.042	0.903
Mean Standard Deviation	-0.284	-0.222	0.066	0.897
Maximum Duration	-0.207	-0.118	0.208	0.829
Phases of Silence				
Number	0.674	0.563	-0.148	-0.337
Mean Duration	-0.057	0.949	-0.300	-0.102
Mean Standard Deviation	-0.047	0.917	-0.217	-0.079
Maximum Duration	0.167	0.883	-0.179	-0.084
Pauses				
Number	0.620	0.528	-0.069	-0.343
Mean Duration	0.392	0.265	-0.002	-0.187
Mean Standard Deviation	0.396	0.670	0.044	-0.162
Maximum Duration	0.217	0.818	-0.018	-0.249
Direct take over , Number	0.634	-0.090	0.572	-0.295
Interruptions, Number				
Successful	0.184	-0.379	0.716	0.292
Unsuccessful	-0.318	-0.273	0.833	0.198
Undecided	0.233	0.045	0.842	-0.020
Changes of Speakers, Number	0.791	0.231	0.043	-0.440

Table 3 Factor Scores for Schizopresent and Normal Families.

+) t - test, two -tailed

Factor	Normal Families (N=28) $\bar{x}$	s	Schizopresent Families (N=30) $\bar{x}$	s	p+)
1	-0.095	0.831	0.089	1.143	-
2	-0.240	0.942	0.224	1.015	0.10
3	0.297	0.789	-0.277	1.105	0.05
4	0.076	0.921	-0.071	1.079	-

Table 4 Factor Scores for Families with Good and Poor Premorbid Adjusted Schizophrenics.

1) t - test, two-tailed
2) t - test, one tailed

Factor	Good premorbid social adjustment (N=12)		Poor premorbid social adjustment (N=18)		p
	$\bar{x}$	s	$\bar{x}$	s	
1	0.097	0.905	0.083	1.303	-[1)]
2	-0.134	0.750	0.493	1.115	0.05[2)]
3	-0.068	1.269	-0.591	0.743	-[2)]
4	-0.113	0.698	-0.042	1.292	-[1)]

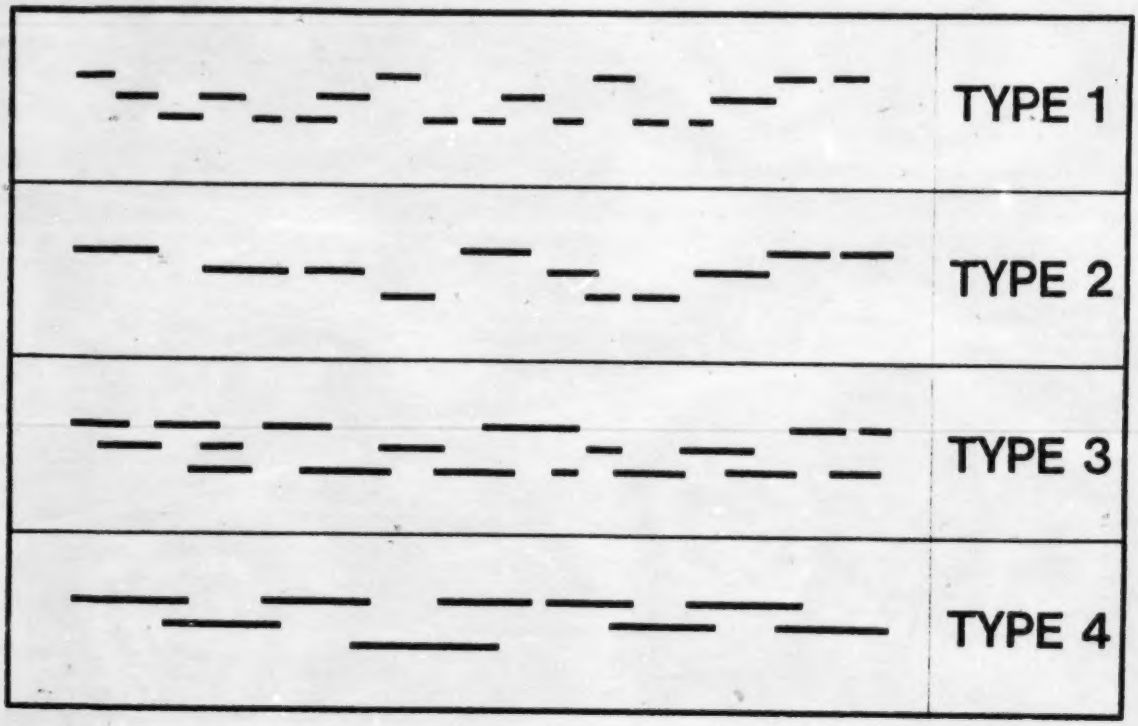
Table 5 Factor Scores for Families with rehospitalized and not rehospitalized Schizophrenics.

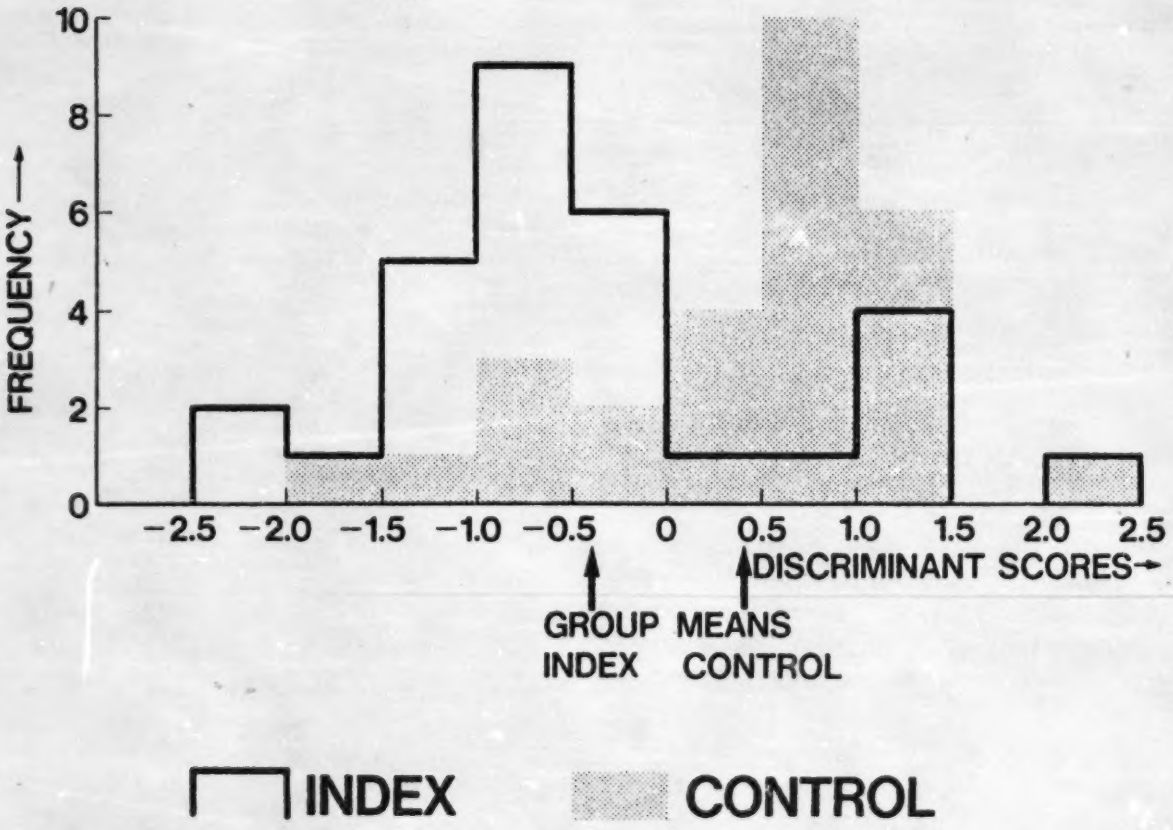
1) t - test, two - tailed
2) t - test, one - tailed

Factor	No rehospitalization (N=17)		Rehospitalisierung (N=13)		p
	$\bar{x}$	s	$\bar{x}$	s	
1	0.242	0.769	-0.112	1.513	-[1)]
2	0.169	1.058	0.297	0.994	-[2)]
3	-0.029	1.337	-0.603	0.603	0.10[2)]
4	0.139	1.271	-0.344	0.719	-[2)]

Figure 1. 4 types of family communication patterns derived by factor analysis.

Figure 2. Discriminant function.


TYPE 1
TYPE 2
TYPE 3
TYPE 4


FREQUENCY
10
8
6
4
2
0
−2.5 −2.0 −1.5 −1.0 −0.5 0 0.5 1.0 1.5 2.0 2.5
DISCRIMINANT SCORES
GROUP MEANS
INDEX CONTROL
INDEX
CONTROL